

IN THE CLAIMS:

Claim 1 (Currently Amended) An optoelectronic device, comprising:

a substrate having a [first] p-type doped region adjacent a first outer surface and [a second] an n-type doped region adjacent a second outer surface, wherein said optoelectronic device is a tunable laser and said substrate further includes a gain region, a tuning region, an amplifier region and a modulator region, and wherein said gain region, said tuning region, said amplifier region and said modulator region are located in said p-type doped region;

a wave guide located in said substrate and located between said first outer surface and said second outer surface; and

a capacitor located over one of said first outer surface or said second outer surface wherein said capacitor is located on said second outer surface and an electrode of said capacitor is electrically coupled to said p-type doped region.

Claim 2 (Original) The optoelectronic device as recited in Claim 1 further including a metal layer located on one of said first outer surface or said second outer surface, said metal layer comprising a first electrode of said capacitor, a dielectric located over said first electrode and a second electrode located over said dielectric.

Claim 3 (Canceled)

Claim 4 (Original) The optoelectronic device as recited in Claim 3 wherein said substrate further includes a grating region.

Claim 5 (Canceled).

Claim 6 (Currently Amended) The optoelectronic device as recited in Claim 1 wherein said substrate comprises indium phosphide [and said first doped region is a p-type doped region and said second doped region is an n-type doped region and said capacitor is located on said second outer surface].

Claim 7 (Original) The optoelectronic device as recited in Claim 1 wherein a dielectric layer of said capacitor is a silicon dioxide or a tantalum pentoxide.

Claims 8-14 (Canceled)

Claim 15 (Currently Amended) An integrated optoelectronic system, comprising:
at least one optical device, including:

an optical substrate having a [first] p-type doped region adjacent a first outer surface and [a second] an n-type doped region adjacent a second outer surface, wherein said optical device is a tunable laser and said optical substrate further includes a gain region, a tuning region, an amplifier region and a modulator region;

a wave guide located in said substrate and located between said first outer surface and said second outer surface; and

a capacitor located over one of said first outer surface or said second outer surface,
wherein said capacitor is located on said second outer surface and an electrode of said capacitor is electrically coupled to said p-type doped region;

an optical fiber coupled to said at least one optical device and located on or within said semiconductor substrate; and

a detector coupled to said at least one optical device.

Claim 16 (Original) The integrated optoelectronic system as recited in Claim 15 further including a metal layer located on one of said first outer surface or said second outer surface, said metal layer comprising a first electrode of said capacitor, a dielectric located over said first electrode and a second electrode located over said dielectric.

Claim17 (Canceled).

Claim 18 (Original) The integrated optoelectronic system as recited in Claim 17 wherein said optical substrate further includes a grating region.

Claim19 (Canceled).

Claim 20 (Currently Amended) The integrated optoelectronic system as recited in Claim 15 wherein said optical substrate comprises indium phosphide [and said first doped region is a p-type

doped region and said second doped region is an n-type doped region and said capacitor is located on said second outer surface].